

## Aristolochic Acid, an Herbal Carcinogen, Sold on the Web after FDA Alert

**TO THE EDITOR:** In 2001, the Food and Drug Administration (FDA) issued warnings and an import alert that herbal products are unsafe if they contain or are suspected to contain aristolochic acid.<sup>1</sup> A report in the *Journal* in 2000 described a cohort of 105 patients in whom rapidly progressive nephropathy developed after they had been given an herbal weight-loss product containing aristolochic acid by a Belgian clinic.<sup>2</sup> Because of a suspected association between aristolochic acid and urothelial carcinoma, 39 patients with end-stage renal disease underwent prophylactic removal of the kidneys and ureters; urothelial carcinoma was diagnosed in 18 of them. Aristolochic acid nephropathy has been reported in eight other countries, and associated urinary tract cancer has been reported in two.<sup>3</sup> The International Agency for Research on Cancer classifies products containing aristolochia species as human carcinogens.<sup>4</sup>

Despite the actions of the FDA, in 2003 we identified 19 products containing aristolochic acid and 95 products suspected to contain aristolochic acid for sale on the Web. These products and approximately 100 related Web sites are listed on the Web at <http://potency.berkeley.edu/aristolochicacid.html>.

These herbal products should not be available but are sold on U.S. Web sites for gastrointestinal symptoms, weight loss, cough, and immune stimulation.

The toxicologic evidence of the risks associated with aristolochic acid is strong. In 1982, tumors were rapidly induced in rats at low doses<sup>5</sup>; aristolochic acid is among the most potent 2 percent of the carcinogens in our Carcinogenic Potency Database.<sup>6</sup> It is mutagenic, forms DNA adducts in humans, and is carcinogenic in mice.<sup>3</sup> In rabbits, aristolochic acid induces nephrotoxic effects, the same DNA adducts in kidney as in humans, and urothelial tumors.<sup>3</sup>

The availability of aristolochic acid-containing products on the Web two years after an FDA alert was issued reveals a serious flaw in the safety protection afforded the public. Under the Dietary Supplement Health Education Act, herbal products do not require FDA approval of efficacy or safety before marketing, and products are not registered. In addition, the Web is a marketing tool with low barriers to entry (anyone can set up a Web site inexpensively). The failure to protect the public from the imminent hazard of aristolochic acid indicates that there is an urgent need to remove these products from the Web.

and to develop a policy that addresses Web sales of hazardous herbal products.

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